

WHAT IS CLAIMED IS :

1. A liquid crystal display, comprising
an insulation substrate;
a terminal section made of a metal film;
an insulation layer formed on the terminal section,
having a contact hole formed therein;
wiring made of a metal film formed by placing a
connection end portion on the upper portion of the insulation
layer, and
a film which is made of a material having an etching
rate slower than that of the insulation layer, and has a
shape extended toward an inside of the contact hole from
the connection end portion of the wire, the film being placed
between the insulation layer and the connection end portion
of the wire, the terminal section, the insulation layer,
the wiring and the film being stacked on the insulation
substrate,
wherein the terminal section and the connection end
portion of the wiring are connected by a connection
conductive film through the contact hole.
2. The liquid crystal display as defined in claim 1,
wherein the film is made from a material that has an etching
rate that is faster than $1/20$, and also slower than $1/2$ of
the etching rate of the insulation layer.

3. The liquid crystal display as defined in claim 1, wherein the connection end portion of the wiring is extended toward the inside of the contact hole.

4. The liquid crystal display as defined in claim 1, wherein the contact hole in the insulation layer is formed after the formation of the wiring.

5. The liquid crystal display as defined in claim 1, wherein the terminal section and the wiring are made from a material that has an etching rate slower than $1/5$ of the etching rate of the insulation layer.

6. The liquid crystal display as defined in claim 1, wherein the film covers a peripheral portion of the contact hole and has a shape that conforms to a peripheral shape of the contact hole.

7. A liquid crystal display comprising:
a terminal section formed on a substrate, to which signals are inputted from outside;
an insulation layer formed on the terminal section;
a film-shaped wiring that is connected to electrodes of thin-film switching elements formed on each pixel; and

a connection conductive film, placed in the contact hole, for connecting the terminal section and the end portion of the wiring,

wherein a semiconductor layer is formed between the wiring and the insulation layer, and the insulation layer, the semiconductor layer and the end portion of the wiring are allowed to respectively stick out toward the inside of the contact hole, with respective depths in this order.

8. A manufacturing method of a liquid crystal display comprising:

a first step for forming a terminal section and a gate electrode made of a metal film on an insulation substrate;

a second step for forming an insulation layer that covers the terminal section and the gate electrode;

a third step for forming a semiconductor film and an ohmic contact film on a connection end portion of the terminal section and the gate electrode so that a film is patterned and formed on the terminal section and a semiconductor operation layer of a thin-film transistor is patterned and formed on the gate electrode by the semiconductor film and the ohmic contact film;

a fourth step for forming wiring so that the connection end portion of the wiring is placed on the film;

a fifth step for forming a contact hole by etching

and removing the insulation layer by using the wiring as a mask; and

a sixth step for connecting the wiring and the terminal section by a connection conductive film through the contact hole.

9. A manufacturing method of a liquid crystal display as defined in claim 8, wherein a process for forming a protective film for coating the insulation layer and the wiring is prepared between the fourth process and the fifth process, and a process for forming a contact hole in the protective film simultaneously with the formation of the contact hole in the insulation layer is prepared in the fifth step.

10. A manufacturing method of a liquid crystal display comprising the steps of:

upon forming a first semiconductor layer for forming a thin-film transistor, forming a second semiconductor layer also in an area of a contact hole;

forming a thin-film transistor which includes the first semiconductor layer, a drain electrode having a through hole or a cut-out section which communicates with the lower layer in the areas of the source electrode and the contact hole so as to provide switching for a pixel;

on the thin-film transistor, stacking a protective film layer and a resin insulation film; and

after forming a contact hole in the resin insulation film, etching and removing the protective film layer below the contact hole so that a pixel display electrode for applying a voltage to the liquid crystal is formed in the area of the contact hole in a manner so as to contact the drain electrode.

11. A manufacturing method of a liquid crystal display comprising the steps of:

forming a gate wire, a gate electrode connected to the gate wire a supplementary capacitance wire on an insulation substrate and a supplementary capacitance electrode connected to the supplementary capacitance wire;

forming a gate insulation film on the respective gate wire, the gate electrode, the supplementary capacitance wire and the supplementary capacitance electrode;

forming a first semiconductor layer made by stacking an a-Si film and an n⁺a-Si film, above the gate electrode through the gate insulation film, as well as simultaneously forming a second semiconductor layer made by stacking an a-Si film and an n⁺a-Si film, above the supplementary capacitance electrode through the gate insulation film;

forming a source electrode and a drain electrode, each

having one end stacked on the second semiconductor layer above the gate electrode, and a source wire serving as a source line connected to the source electrode, the drain electrode having the other end also stacked on the first semiconductor layer above the supplementary capacitance electrode with the other end being provided with a cut-out section or a through hole;

etching and removing the n^+a -Si film of the second semiconductor layer above the supplementary capacitance electrode while using the drain electrode having the cut-out section or the through hole as a mask;

simultaneously with the etching process of the n^+a -Si film of the second semiconductor layer above the supplementary capacitance electrode, etching and separating the n^+a -Si film of the first semiconductor layer while using as masks the source electrode and the drain electrode, each having one end stacked on the first semiconductor layer above the gate electrode;

forming a protective film layer over the entire surface of the substrate; forming a resin insulation film on the protective film layer; forming a contact hole in the resin insulation film with the pattern of the cut-out section or the through hole of the drain electrode above the supplementary capacitance electrode being allowed to
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the resin insulation film on the source signal input terminal, the gate signal input terminal and the supplementary capacitance signal input terminal;

simultaneously etching and removing the protective film layer on the source signal input terminal, the gate signal input terminal and the supplementary capacitance signal input terminal and the protective film layer on the bottom face section within the contact hole, while using as etching masks the patterned resin insulation film and the pattern of the cut-out section or the through hole of the drain electrode within the contact hole; and

etching the gate insulation film on the gate signal input terminal and the supplementary capacitance signal input terminal so as to remove the gate insulation film on the gate signal input terminal, as well as simultaneously etching the a-Si film of the second semiconductor layer at a portion thereof exposed to an area surrounded by the cut-out section or the through hole of the drain electrode and the contact hole.

12. The manufacturing method of a liquid crystal display as defined in claim 11, wherein the cut-out section or the through hole, placed in the drain electrode inside the contact hole, is formed so as to have at least one portion thereof extended sideways from the area of the contact hole.

13. The manufacturing method of a liquid crystal display as defined in claim 11, wherein, with respect to the relationship between the a-Si film of the second semiconductor layer exposed to the area surrounded by the edge of the cut-out section or the through hole of the drain electrode as well as the edge of the contact hole and the gate insulation film within the area on the gate signal input terminal and the source signal input terminal side, the ratio of the respective etching rates is virtually the same as the ratio of the respective film thicknesses.